

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
CONSTRUCTION OF FACILITIES  
FISCAL YEAR 2000 ESTIMATES**

**SUMMARY**

**LAUNCH VEHICLES AND PAYLOAD OPERATIONS**

	<u>Amount</u> <u>(Dollars)</u>	<u>Page</u> <u>No</u>
<u>Space Shuttle:</u>		
Restore Pad Surfaces and Slopes, Pad B (KSC)	1,800,000	MS 4-9
Restore Wall and Ceiling Integrity, Payload Changeout Room, Pad B (KSC)	2,300,000	MS 4-11
Rehabilitate 480V Electrical Distribution System, External Tank Manufacturing Building (MAF)	1,800,000	MS 4-13
Minor Facility Projects at Various Locations, not in excess of \$1,500,000 per project	<u>2,400,000</u>	
Repair and Modernize Space Shuttle Main Engine Test Stand A-2	(1,400,000)	
Construct Convoy Shelter and Staging Facility	(1,000,000)	
Facility Planning and Design	2,700,000	
Total Launch Vehicles and Payload Operations	<u>11,000,000</u>	

**CONSTRUCTION OF FACILITIES  
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PROJECT TITLE: Restore Pad Surfaces and Slopes, Pad B

INSTALLATION: John F. Kennedy Space Center

FY 2000 Estimate: \$1,800,000

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LOCATION OF PROJECT: Kennedy Space Center, Brevard County, Cape Canaveral, Florida

COGNIZANT HEADQUARTERS OFFICE: Office of Space Flight

FY 1999 AND PRIOR YEARS FUNDING: The following prior years funding is related to this project:

	<u>Planning And Design</u>	<u>Construction</u>	<u>Total</u>
Specific Construction Funding . . . . .	\$108,000	\$ ---	\$108,000
Capitalized Investment . . . . .	---	<u>105,948,950</u>	<u>105,948,950</u>
Total . . . . .	<u>\$108,000</u>	<u>\$105,948,950</u>	<u>\$106,056,950</u>

SUMMARY PURPOSE AND SCOPE:

This project restores the structural concrete of the launch pad surfaces to prevent the ingress of water, which accelerates deterioration of subbase materials and imbedded reinforcing steel. Pad B is required for Kennedy Space Center to perform its assigned Agency roles and missions.

PROJECT JUSTIFICATION:

Pad B's concrete surface, slopes, and catacomb areas are over 30 years old. They are deteriorated with cracks, spalling, and broken sections that are unsafe for launch operations. The cracks in the pad surface permit water to leak into and weaken the underlying compacted fill. Launch vibration and hydrostatic pressure on the undermined slopes cause the concrete panels to crack further and break into pieces. Cracks in the pad surfaces allow acidic launch water to erode the pad rebar, which results in spalling failures of the catacomb ceiling and a structural weakening of the launch pad. The crawlerway grid path also has cracks in the substructure, which allows water to undermine the slopes and also erode the catacomb rebar and concrete.

IMPACT OF DELAY:

Failure to provide timely repair of the launch pad concrete surfaces will accelerate the rate of water infiltration and subsequent structural weakening, rapidly increasing the ultimate repair cost. If current conditions are not corrected soon, the potential will develop whereby the Shuttle could sustain foreign object damage during launch.

PROJECT DESCRIPTION:

This project repairs cracks in the launch pad concrete surfaces and replaces or repairs fractured and broken sections of concrete. The cracked areas of the pad slopes will be sealed, and the broken, raised or "bulged" portions will be removed. The underlying fill will be replaced and re-compacted. The subbase under the crawlerway slabs will be repaired. Cracks and joints on the pad surface will be sealed. The cracks in the concrete ceiling structure of the catacombs will be repaired.

FY 2000 PROJECT COST ESTIMATE:

	<u>Unit of Measure</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Civil/Structural . . . . .	LS	---	---	\$1,800,000
Total . . . . .				<u>\$1,800,000</u>

OTHER EQUIPMENT SUMMARY: None

FUTURE ESTIMATED CONSTRUCTION FUNDING REQUIRED TO COMPLETE THIS PROJECT: None

**CONSTRUCTION OF FACILITIES  
FISCAL YEAR 2000 ESTIMATES**

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PROJECT TITLE: Restore Wall and Ceiling Integrity, Payload Changeout Room, Pad B

INSTALLATION: John F. Kennedy Space Center

FY 2000 Estimate: \$2,300,000

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LOCATION OF PROJECT: Kennedy Space Center, Brevard County, Cape Canaveral, Florida

COGNIZANT HEADQUARTERS OFFICE: Office of Space Flight

FY 1999 AND PRIOR YEARS FUNDING: The following prior years funding is related to this project:

	<u>Planning And Design</u>	<u>Construction</u>	<u>Total</u>
Specific Construction Funding . . . . .	\$184,460	---	\$ 184,460
Capitalized Investment . . . . .	---	<u>\$105,948,950</u>	<u>105,948,950</u>
Total . . . . .	<u>\$184,460</u>	<u>\$105,948,950</u>	<u>\$106,133,410</u>

SUMMARY PURPOSE AND SCOPE:

The Launch Complex 39 Pad B Payload Changeout Room (PCR) was designed and built to provide a controlled environment for pre-flight services of space shuttle hardware. This project replaces damaged structures that allow contaminants to enter the PCR's controlled space. Project completion enhances the efficient and effective operation and maintenance of the PCR and supporting utilities. The PCR is required for Kennedy Space Center to perform its assigned Agency roles and missions.

PROJECT JUSTIFICATION:

Contamination levels within the PCR have increased significantly. These contaminants enter the PCR via the weather damaged exterior walls and deteriorated access doors, which no longer maintain necessary pressurization levels. Friable insulation associated with mechanical components also contributes to the contamination. Current conditions will soon cause the payload processing environment to exceed acceptable limits for contamination and pressurization capability and therefore become a launch constraint.

IMPACT OF DELAY:

Failure to provide timely repair of the PCR structure and supporting mechanical systems will allow contamination levels to exceed acceptable limits. This will hinder space shuttle launch preparation and potentially cause launch delays. Operation and maintenance costs associated with keeping the deteriorated structure and mechanical components operating will dramatically increase.

PROJECT DESCRIPTION:

This project replaces damaged PCR wall panels; illuminates the access area within the PCR plenum, replaces the ceiling grid assembly, and replaces or eliminates various leaking access doors. The high efficiency particular air (HEPA) filter housing will be reconfigured to allow safer accessibility.

FY 2000 PROJECT COST ESTIMATE:

	<u>Unit of Measure</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Civil/Structural . . . . .	Lump Sum(LS)	--	---	\$1,900,000
Mechanical . . . . .	LS	---	---	200,000
Electrical . . . . .	LS	---	---	200,000
Total . . . . .				<u>\$2,300,000</u>

OTHER EQUIPMENT SUMMARY: None

FUTURE ESTIMATED CONSTRUCTION FUNDING REQUIRED TO COMPLETE THIS PROJECT: None

**CONSTRUCTION OF FACILITIES  
FISCAL YEAR 2000 ESTIMATES**

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PROJECT TITLE: Rehabilitate 480V Electrical Distribution System, External Tank Manufacturing Building

INSTALLATION: Michoud Assembly Facility

FY 2000 ESTIMATE: \$1,800,000

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LOCATION OF PROJECT: New Orleans, Orleans Parish, Louisiana

COGNIZANT HEADQUARTERS OFFICE: Office of Space Flight

FY 1999 AND PRIOR YEARS FUNDING: The following prior years funding is related to this project:

	<u>Planning and Design</u>	<u>Construction</u>	<u>Total</u>
Specific Construction Funding . . . . .	\$656,000	\$ 7,300,000	\$ 7,956,000
Capitalized Investment . . . . .	---	<u>55,444,885</u>	<u>55,444,885</u>
Total . . . . .	<u>\$656,000</u>	<u>\$62,744,885</u>	<u>\$63,400,885</u>

SUMMARY PURPOSE AND SCOPE:

This project rehabilitates and modifies the 480V electrical distribution system which supports critical External Tank (ET) manufacturing operations in the Barrel Mechanical Assembly, Harness and Tool Fabrication Areas, and the Thermal Protection System Development Area of the ET Manufacturing Building (103). This project specifically replaces the electrical distribution system associated with substations 4, 5, and 7B. It is required to restore quality and reliability to the electrical power system and avoid costly piecemeal repairs. Building 103 is required for the Michoud Assembly Facility to perform its assigned Agency roles and missions.

PROJECT JUSTIFICATION:

The 480V electrical distribution system in Building 103 was originally installed in the 1940's. Exposed distribution feeders resulting from cracked insulation and "spot" overloads combine to create potential production shutdowns. Existing bus ducts are inaccessible for maintenance. Feeder taps to fan houses lack over-current protection. Main distribution and sub-distribution panels and associated breakers are obsolete. Existing grounding does not meet the National Electric Code (NEC) or current design standards. An in-house long-range electrical plan and a subsequent A/E study recommend upgrade of the 480V power

distribution system. This project corrects the unsafe and unreliable 480V electrical distribution system from substations 4, 5, and 7B to the Barrel Mechanical Assembly, Harness and Tool Fabrication Areas, and the Thermal Protection System Development Area of Building 103.

IMPACT OF DELAY:

Failure to rehabilitate exposed feeders, hot spots, and improper grounding will likely result in production shutdowns in the Barrel Mechanical Assembly, Harness and Tool Fabrication Areas, and the Thermal Protection System Development Area of the External Tank manufacturing operations.

PROJECT DESCRIPTION:

This project completes the systematic rehabilitation of older high-voltage systems in critical production areas of Building 103. It replaces transformers and switchgear, breakers and oil switches, and installs new main distribution and sub-distribution power panels. New electrical distribution feeders will be routed in cable trays for ease of maintenance. Electrical distribution circuits will be designed to eliminate the need for bus ducts. The new distribution system will be tied into substation switchgear and the old distribution system will be demolished.

FY 2000 PROJECT COST ESTIMATE:

	<u>Unit of Measure</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Electrical . . . . .	LS	---	---	\$1,800,000
Total . . . . .				<u>\$1,800,000</u>

OTHER EQUIPMENT SUMMARY: None

FUTURE ESTIMATED CONSTRUCTION FUNDING REQUIRED TO COMPLETE THIS PROJECT: None